

**#667**

**VOYAGER 2**

**URANUS ENCOUNTER MAGNETOMETER DATA**

**HG COORDINATES 77-076A-05G  
U1 COORDINATES 77-076A-05H**

REQ. AGENT  
DHG

RAND NO.

ACQ. AGENT  
PSB

VOYAGER 2

URANUS ENCOUNTER MAGNETOMETER DATA

77-076A-05G (HG COORDINATES)  
77-076A-05H (U1 COORDINATES)

This data set catalog contains four tapes (3 for 05G, and 1 for 05H). The tapes are 9-track, binary, 1600 bpi. They are IBM Standard Label (one data file, one header file and one trailer file). The D and C numbers and time spans follow:

77-076A-05G - HG COORDINATES

<u>D#</u>	<u>C#</u>	<u>TIME SPAN</u>
D-78711	C-26812	01/19/86 - 01/24/86
D-78712	C-26813	01/23/86 - 01/25/86
D-78713	C-26814	01/24/86 - 01/30/86

77-076A-05H - U1 COORDINATES

<u>D#</u>	<u>C#</u>	<u>TIME SPAN</u>
D-78714	C-26815	01/23/86 - 01/25/86

YY-046A-05G  
05H

Voyager Conjoint Data Tape Format  
For Combined MAG And PLS Analysis

Tapes are IBM standard label, 9 track and contain IBM variable blocked (VB) records. Master tapes are 6250 BPI, distribution copies may be 1600/800 BPI.

There are four distinct types of records: header; magnetometer science; plasma science; and engineering. All Master Library tapes will contain all data record types. Prior to filing of these tapes in the NSSDC at GSFC, any tapes distributed outside the principal sphere of interest (MIT and GSFC), will contain only one type of data (MAG or PLS) plus engineering, unless there is mutual PI agreement to do otherwise.

Engineering records always precede science records. Science records are time ordered by the end time of the PLS data blocks and the begin time of the MAG data blocks. The time tag represents the begin time of a block.

The first word in each record is an identifier for that type of data. The following table lists the record characteristics and their frequency of occurrence.

Record Type	ID	Rate	Length (Bytes)	Mode
Engineering	ENG	1/12min	1092v	GS3,CR1,CR2
		1/48min		CR3,CR4,CR5,CR6,CR7
Low field magnetometer	LFM	1/48sec	2076	All modes
Proton high resolution	M	1/12sec	2540v	CR1
		1/96sec		GS3,CR2,CR3,CR4
		1/192sec		CR5,CR6
Proton low resolution	L	1/96sec	1056	GS3,CR2,CR3,CR4
		1/192sec		CR5,CR6
		1/384sec		CR7
Electron	E1/E2	1/12sec	880	CR1
		2/96sec		GS3,CR2,CR3,CR4
		2/192sec		CR5,CR6
		2/384sec		CR7

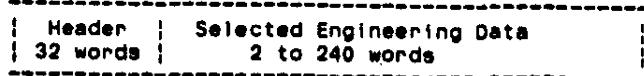
High field MAG data is not compacted and therefore will not appear on this tape.

The DD card necessary to read this tape is:

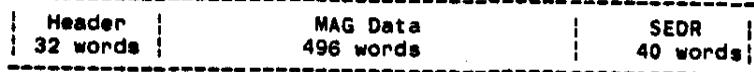
```
//ddname DD UNIT=(9TRACK,,DEFER),LABEL=(,SL),DISP=SHR,  
//      DCB=(RECFM=VB,LRECL=4228,BLKSIZE=18260,DEN=4),  
//      DSN=VOYAGER.CONJOINT.MAG.PLS,VOL=SER=xxxxxx
```

Each logical record consists of two or more parts. The following diagrams show the different record types and the different segments in each.

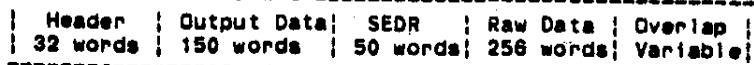
ENG - Engineering



LFM - Magnetometer



M - Proton Mode



## L - Proton Mode

Header 32 words	Output Data 150 words	SEDR 50 words	Raw Data 32 words
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## E1/E2 - Electron Mode

Header 32 words	Output Data 80 words	SEDR 50 words	Raw Data 8 words
--------------------	-------------------------	------------------	---------------------

Because of the variable length of each record, a word has been added to each record header block to allow the use of FORTRAN in reading this tape. The last halfword of the block contains the count of the number of words remaining in the logical record.

TABLE

## MAGNETIC FIELD EXPERIMENT EFFECTIVE SAMPLE OUTPUT PERIOD

All columns are LFM only except for the last.

FORMAT		CR-1	CR-2	CR-3	CR-4	CR-5	CR-6	CS-3	HFM
TYPE		DR	AVE	AVE	DIFF	DM	DM	DIFF	DR
STATUS PERIOD (SEC)		9.6	9.6	9.6	9.6	48.	288.	4.8	4.8
DATA OUTPUT PERIOD (SEC)	P	.06	.12	.24	.30	.24	1.92	.06	.60
	S	.06	.24	.96	2.4	.96	3.84	.12	.60
FULL WORD PERIOD (SEC)	P	.06	.12	.24	4.8	4.8	57.6	.30	.60
	S	.06	.24	.96	9.60	9.60	57.6	.60	.60
DATA WORDS PER DATA BLOCK	P	160	80	40	32	200	150	80	8
	S	160	40	10	4	50	75	40	8
FULL WORDS PER DATA BLOCK	P	160	80	40	2	10	5	16	8
	S	160	40	10	1	5	5	8	8
SAMPLES PER FULL WORD	P	1	1	1	16	20	30	5	1
	S	1	1	1	4	10	15	.5	1

P = PRIMARY MAG (one sensor only)  
 S = Secondary MAG (one sensor only)

DR = Direct Readout  
 AVE = Averaging  
 DIFF = 6 bit differencing of averaged or direct readout data  
 DM = 2 bit delta modulation of averaged data

This table represents only one sensor of a vector magnetometer output.

Common Record Header Block

RELATIVE WORD	TYPE*LEN	DESCRIPTION
1	A*4	Data identifier: "ENG", "LFM", "M ", "L ", "E1 ", "E2 ", "HDR1", "HDR3"
2	A*4	Telemetry format
3	A*4	s/c id: "FLT1" or "FLT2"
4	I*2	Year of data - 1900 (time tag for beginning of data block)
	I*2	Day of year (Jan 1 = 1)
5	I*2	Hour of day (0-23)
	I*2	Minute of hour (0-59)
6	I*2	Second of minute (0-59)
	I*2	Millisecond of second (0-999)
7-8	R*8	Decimal day of year of data (Jan 1 = 0)
9-10	R*8	Decimal day count since 20AUG77
11	A*4	Type of time: SCET or ERT
12	R*4	Time period of this data block in seconds
13	I*2	2**16 seq counter of data at time of telemetry readout (increments once in 48 min). This field must be interpreted as an unsigned integer.
	I*2	Modulo 60 seq counter of data readout (increments once in 48 sec)
14	I*2	Line counter of data readout (1-800) (increments once in 60 ms)
	I*2	SPARE
15	Z*4	Status word
16	Z*4	Command
17	I*2	Data identifier: LFM=1, HFM=2, M=3, E1=4, L=5, E2=6, ENG=7, HDR1=8, HDR3=10
	I*2	Data rate: GS3=0, CR1=1, CR2=2, CR3=3, CR4=4, CR5A=5, CR6A=6, CR6B=7, CR5B=8
18		SPARE
19-20	A*8	A character flag which indicates software or s/c hardware intervention reducing confidence in data
21-29		SPARE
30-31	4(I*2)	# of primary data words, # of secondary data words, # of primary full words, # of secondary full words (LFM only)
32	I*2	Record number on tape
	I*2	Number of words remaining in logical record

## LFM Data Area

RELATIVE WORD	TYPE+LEN	DESCRIPTION
----- 48 sec av (ROTATED) -----		
1	R*4	F1: average of 9.6 sec norms in gammas
2	R*4	F2: norm of (B1,B2,B3) in gammas
3	R*4	DELTA: arsin(B3/F2) in degrees
4	R*4	LAMBDA: 180 - atan(B2,-B1) in degrees
5	R*4	B1: average of first 9.6 sec component in gammas
6	R*4	B2: average of second 9.6 sec component in gammas
7	R*4	B3: average of third 9.6 sec component in gammas
8-10	3(R*4)	RMS: rms vector in gammas
11	I*4	N: number of 9.6 sec avs that make up this average (1e 5)
----- 9.6 sec av (ROTATED) -----		
12-16	5(R*4)	F1: averages of 1.92 sec norms in gammas
17-21	5(R*4)	F2: norms of (B1,B2,B3) in gammas
22-26	5(R*4)	DELTA: arsin(B3/F2) in degrees
27-31	5(R*4)	LAMBDA: 180 - atan(B2,-B1) in degrees
32-36	5(R*4)	B1: averages of first 1.92 sec component in gammas
37-41	5(R*4)	B2: averages of second 1.92 sec component in gammas
42-46	5(R*4)	B3: averages of third 1.92 sec component in gammas
47-61	15(R*4)	RMS: rms vectors in gammas (3 x 5)
62-66	5(I*4)	N: Number of 1.92 sec avs that make up this average (1e 5)
----- 1.92 sec av (ROTATED) -----		
67-91	25(R*4)	F1: averages of detail point norms in gammas
-----		
92-116	25(R*4)	F2: norms of (B1,B2,B3) in gammas
117-141	25(R*4)	DELTA: arsin(B3/F2) in degrees
142-166	25(R*4)	LAMBDA: 180 - atan(B2,-B1) in degrees
167-191	25(R*4)	B1: averages of first detail component in gammas
192-216	25(R*4)	B2: averages of second detail component in gammas
217-241	25(R*4)	B3: averages of third detail component in gammas

LFM Data Area

242-316      75(R\*4)    RMS: PAYLOAD rms vectors in gammas (3 X 25)

317-341      25(I\*4)    N: number of detail points that make up this average

----- s/c field averages (PAYLOAD) -----

342-488      SPARE

489-491      3(R\*4)    RMS: vector rms in gammas

492            I\*4      NSC: number of averages in 48 secs

493            R\*4      SCX: average of first field component in gammas

494            R\*4      SCY: average of second field component in gammas

495            R\*4      SXZ: average of third field component in gammas

496            R\*4      SCF: norm of (SCX,SCY,SCZ) in gammas

Note: For Jupiter System III and Saturn Longitude System, (B1,B2,B3) are Spherical coordinates (Br,Btheta,Bphi) while the angles DELTA and LAMBDA are derived from Cartesian coordinates (Bx,By,Bz).

Engineering Data Area

RELATIVE WORD	TYPE*LEN	DESCRIPTION
1	I*2	Deck (Eng code 620-672)
	I*2	Value of ENG
2	R*4	"read-out" time of data in seconds past time on record header block
3-240		repeat words 1 and 2 for each new set

Since only engineering parameters which change are entered into the record, the record is of variable length.

**SEDR Data Block**

<b>RELATIVE WORD</b>	<b>TYPE*LEN</b>	<b>DESCRIPTION</b>
1-2	R*8	TN: epicday of navigation block "closest" to data
3-4	R*8	TP: epicday of pointing vector block "closest" to data
5-10	R*4	Spacecraft relative position vector and velocity vector in  HG: Inertial Sun Equator System (AU,km/sec). Time tag is TN.  S3: Jupiter Vernal Equinox System (Jupiter radii,km/sec) Time tag is TN.  L1: Saturn Vernal Equinox System (Saturn radii,km/sec) Time tag is TN.
11	R*4	Spacecraft distance from  HG: Sun in AU. Time tag is TN.  S3: Jupiter in Jupiter radii. Time tag is TN.  L1: Saturn in Saturn radii. Time tag is TN.
12-13	R*4	Spacecraft relative longitude & latitude in radians in  HG: Inertial Sun Equator System. Time tag is TN.  S3: Jupiter latitude,Jupiter System III longitude. Time tag is TN.  L1: Saturn latitude,Saturn Longitude System longitude. Time tag is TN.  Note $0 \leq \text{longitude} < 2\pi$ and $-\pi/2 \leq \text{latitude} \leq +\pi/2$
14-22	R*4	HG: Matrix to rotate data from Inertial Sun Equator System to Inertial Heliographic System. Time tag is TN.  S3: Matrix to rotate data from Jupiter System III Cartesian to Jupiter System III Spherical. Time tag is DT.  L1: Matrix to rotate data from Saturn Longitude System Cartesian to Saturn  Longitude System Spherical. Time tag is DT.
23-31	R*4	HG: Matrix to rotate data from Inertial Heliographic System to Earth-Orbit-True System. Time tag is TN.  S3: Matrix to rotate data from payload to Jupiter System III Cartesian. Time tag is DT.  L1: Matrix to rotate data from payload to Saturn Longitude System Cartesian. Time tag is DT.
32-40	R*4	HG: Matrix to rotate data from payload

SEDR Data Block

to Inertial Heliographic System. Time tag is DT.

S3: Matrix to rotate data from payload to Jupiter System III Spherical. Time tag is DT.

L1: Matrix to rotate data from payload to Saturn Longitude System Spherical. Time tag is DT.

41-50

SPARE

Matrices are left multiplying with elements in the order:

1	2	3
4	5	6
7	8	9

Time tag TN is relative words 1-2 above. Time tag DT is record header time plus 1/2 the length of the data record. When MAG(28) switch is on and the record is LFM, the time tag for relative words 32-40 above is record header time plus 47.04 seconds.

Coordinates: HG= (BR,BT,BN); S3 or L1 Spherical= (Br,Btheta,Bphi); S3 or L1 Cartesian= (Bx,By,Bz).

Header Records

Description of MJS summary tape (and MAG detail tape)  
HDR1 records at beginning and end of tape(s).

RELATIVE WORD	TYPE*LEN	DESCRIPTION
1	A*4	"HDR1"
2	A*4	Telemetry format
3	A*4	s/c id: "FLT1" or "FLT2"
4	I*2	Year of data - 1900 (from first data record)
	I*2	Day of year of data
5	I*2	Hour of day of data
	I*2	Minute of day of data
6	I*2	Second of minute of data
	I*2	Millisecond of second of data
7	I*4	Year of this run
8	I*4	Calendar day of year of this run
9	A*4	Month of this run
10	I*4	Day of month of this run
11-12	A*8	Run type: "CRUISE" or "ENCOUNTR"
13	A*4	Coordinate system (not on detail tape)
14-16		SPARE
17	I*2	Data identifier=8 (not on detail tape)
	I*2	SPARE
18-31		SPARE
32	I*2	Record number on tape
	I*2	Number of words remaining in logical record
33-52	10(A*8)	List of mounted EDR volume serial numbers
53-64	6(A*8)	List of mounted SEDR volume serial numbers
65-68	A*8	Volume serial number of summary tape
69-72	A*8	Volume serial number of MAG detail tape
73-76	32(L*1)	System switching vectors
77-84	32(L*1)	MAG switching vectors
85-92	32(L*1)	PLS switching vectors
93-94	A*8	Name of zeroes
95-96	A*8	Name of sensitivities
97-98	A*8	Name of calibrations

Header Records

99-100

SPARE

NOTE: Some fields may be incomplete when this record is at the beginning of the tape.

Header Records

Description of MJS summary tape HDR3 records to be placed after each HDR1 record.

RELATIVE WORD	TYPE*LEN	DESCRIPTION
1	A*4	"HDR3"
2-3		SPARE
4	I*2	Year of data - 1900 (from first data record)
	I*2	Day of year of data
5	I*2	Hour of day of data
	I*2	Minute of day of data
6	I*2	Second of minute of data
	I*2	Millisecond of second of data
7-16		SPARE
17	I*2	Data identifier=10
	I*2	SPARE
18-31		SPARE
32	I*2	Record number on tape
	I*2	Number of words remaining in logical record
33-1056	A*4096	Contents of PLCONS common block

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1

DESCRIPTION OF "ANSWER" (ANS) ARRAY					
WORD	QUANTITY	MNEMONIC	TYPE	DEFINITION	UNITS
1 a)			I*2	number of words in ANS array	many
b)		NTALLY		tally of the calls to PLSANL	PLSANL
2 a)		IPK (4)	I*2	peak channel number sensor A	KNTCUR
b)				" " "	B
3 a)			I*2	" " "	C
b)				" " "	D
4			R*4	delta time from start of mode to peak	sec
5	$B_x$	BX	R*4	components of B field in spacecraft coordinates (x,y,z)	r
6	$B_y$	BY	"		GETFLD
7	$B_z$	BZ	"		
8	$ B $	BMAG	R*4	square root of sum of squared average components	r
9		F2	R*4	average of $(B_x^2 + B_y^2 + B_z^2)/2$	r
10		RMS (3)	R*4	vector RMS of B field, spacecraft coordinates	r
11					GETFLD
12					
13		NA	I*4	number of MAG samples in this average (0 if bad data)	GETFLD
14			R*4	delta time from peak to mag field average	sec
15			R*4	time period of field average	sec
					GETFLD

1.15-10

## ----- Moment Calculations -----

Moments usually taken over 8 channels above peak and 12 below. Stopped at 3 times noise level or saturation see items 16 through 19.

16	$J_A^{mom}$	JACUPMOM	R*4	number of channels used in moment calculation, cup A	#	PRANAL	
17	$J_B^{mom}$	JBCUPMOM		B			
18	$J_C^{mom}$	JCCUPMOM		C			
19	$J_D^{mom}$	JDCUPMOM		D			
20	$n_A$	NACUP	R*4	density from moments, for each cup	$\#/cm^3$	PRANAL MOMENT	
21	$n_B$	NBCUP					
22	$n_C$	NCCUP					
23	$n_D$	ND CUP					
24	$v_{An}$	VACUPN	R*4	velocity component along normal of each cup	km/sec	PRANAL MOMENT	
25	$v_{Bn}$	VBCUPN					
26	$v_{Cn}$	VCCUPN					
27	$v_{Dn}$	VDCUPN					
28	$v_x^{mom}$	VXMOM	R*4	velocity from moments, spacecraft coordinates x,y,z (i.e. no aberration correction)	km/sec	PRANAL	
29	$v_y^{mom}$	VY MOM					
30	$v_z^{mom}$	VZ MOM					
31	$ V $	VMAG	R*4	velocity from moments, spacecraft R, $\theta$ , $\phi$	km/sec	PRANAL	
32	$\theta^{mom}$	THETAMOM					
33	$\phi^{mom}$	PHIMOM					
34	$w_{An}$	WACUPN	R*4	thermal speed from moments, for each cup	km/sec	PRANAL MOMENT	
35	$w_{Bn}$	WBCUPN					

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36	$W_{Cn}$	WCCUPN				
37	$W_{Dn}$	WDCUPN				
38	$\bar{n}_{atom}$	WBARMOM	R*4	average density from moments	$\#/\text{cm}^3$	PRANAL
39	$\bar{n}_n$	DN	R*4	density criterion (no transparency correction)		
40	$W_{mom}$	WNOM	R*4	thermal speed from moment (reconstructed using field)	km/sec	PRANAL/ MOMENT
41	A	A1P	R*4	anisotropy of proton thermal speed (moments), $W_{par}/W_{perp}$		PRANAL
42	$\chi_w^2$	CHI2W	R*4	cost function (normalized square of residuals) for thermal speed fit by PARPER		PRANAL/ (PARPER)
43	$q_A$	QACURMOM	R*4	heat flux from moments for each cup	km/sec	PRANAL/ MOMENT
44	$q_B$	QCUCUPMOM				
45	$q_C$	QCUCUPMOM				
46	$q_D$	QDCUPMOM				
47	$q_{11}$	QPAR	R*4	$Q_{parallel} + 5^*Q_{perpendicular}$ again reconstructed and unreliable		PARPER/ PRANAL
48	$x_q^2$	CHI2Q	R*4	normalized square residuals for heat flux		PRANAL
49	$y_x^{fit}$	VXBAPPFT	R*4			
50	$y_y^{fit}$	VYBAPPFT		velocity of protons from fit routine spacecraft	$\text{km/sec}$	PRANAL/ MJSFIT
51	$y_z^{fit}$	VZBAPPFT				
52	$\bar{n}^{fit}$	WBAPPFT	R*4	density of protons from fit	$\$/cc$	PRANAL/ MJSFIT

## --- Fit Calculations ---

There are several fitting options; the default is an isotropic proton and an isotropic alpha Maxwellian. Items 49 through 63 summarize the results of the fitting procedure. The quantities are averages over the appropriate peaks weighted by the number density of the peaks.

## MC1010/12 (10/23/90)

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53	$\theta$ fit	MBARFFT	R*4	thermal width of protons from fit, averaged	km/sec	PRANAL/ MJSFIT
54	$A$ fit	ABARFFT	R*4	anisotropy of protons from fit		PRANAL/ MJSFIT
55	$\dot{q}$ fit	QBARFFT	R*4	heat flux of protons from fit, normalized		PRANAL/ MJSFIT
56	$V_x$ fit	VBARFFT	R*4	velocity of alphas from fit, spacecraft x,y,z	km/sec	PRANAL/ MJSFIT
57	$V_y$ fit	VBARFFT				
58	$V_z$ fit	VBARFFT				
59	$n$ fit	NBARFFT	R*4	density of alphas from fit	t/cc	PRANAL/ MJSFIT
60	$\theta$ fit	MBARFFT	R*4	thermal width of alphas from fit	km/sec	PRANAL/ MJSFIT
61	$A$ fit	ABARFFT	R*4	anisotropy of alphas from fit		PRANAL/ MJSFIT
62	$\dot{q}$ fit	QBARFFT	R*	heat flux of alphas from fit, normalized		PRANAL/ MJSFIT
63	$\delta V_{\alpha-p}$	DVAMPFT	R*4	delta velocity between alphas and protons from fit	km/sec	PRANAL/ MJSFIT
				fit, information on first peak		
64	$V_x^{1p}$	V1P	R*4	velocity of first proton peak, spacecraft x,y,z	km/sec	PRANAL/ MJSFIT
65	$V_y^{1p}$	V1P				
66	$V_z^{1p}$	V1P				
67	$n^{1p}$	N1P	R*4	density of first proton peak	$\#/\text{cm}^3$	PRANAL/ MJSFIT
68	$W_{  }^{1p}$	WP1P	R*	thermal width parallel to B field for first proton bi-maxwellian	km/sec	PRANAL/ MJSFIT
69	$W_{\perp}^{1p}$	WP1P	R*4	thermal width perpendicular to B field for first proton bi-maxwellian	km/sec	PRANAL/ MJSFIT

fit, information on second peak						
70	$\delta V^2 p$	DV2P	R*4	R*4	difference in bulk velocity between first and second proton (along B required)	km/sec
71	$n^2 p$	N2P	R*4	R*4	density of second proton fit	PRANAL/ MJSFIT
72	$W_{  }^2 p$	WPAR2P	R*4	R*4	thermal width of second proton maxwellian parallel to B field	km/sec
73	$W_z^2 p$	WPER2P	R*4	R*4	thermal width of second proton; maxwellian; perpendicular to B field	PRANAL/ MJSFIT
fit, information on first alpha peak						
74	$\delta V^1 \alpha$	DV1A	R*4	R*4	velocity difference between first proton and first alpha.	km/sec
75	$n^1 \alpha$	N1A	R*4	R*4	density of first alpha,	PRANAL/ MJSFIT
76	$W_{  }^1 \alpha$	WPAR1A	R*4	R*4	thermal width of first alpha, parallel to B	km/sec
77	$W_z^1 \alpha$	WPER1A	R*4	R*4	thermal width of first alpha, perpendicular to B	PRANAL/ MJSFIT
fit, information on second alpha peak						
78	$\delta V^2 \alpha$	DV2A	R*4	R*4	velocity difference between second alpha and first proton,	km/sec
79	$n^2 \alpha$	N2A	R*4	R*4	density of second alpha	PRANAL/ MJSFIT
80	$W_{  }^2 \alpha$	WPAR2A	R*4	R*4	thermal width of second alpha parallel to B field	km/sec
81	$W_z^2 \alpha$	WPER2A	R*4	R*4	thermal width of second alpha perpendicular to B field	km/sec
82	$\log_{10} x^2$	LOGHI2	R*4	R*4	log10 of cost function (sum of squares of residuals)	

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general information

83	$\log_{10} x^2_{\text{ext}}$	L0GCH2E	R*4	$\log_{10}$ of cost function (sum of squares of residuals over all data)
84	I CALL	ICALL	R*4	number of iterations performed by fit routine
85	I EQUAL	IQUAL	R*4	related to reason for termination of fit procedure
86	J A fit	JACUPFT	R*4	number of channels from each cup used in fit
87	J B fit	JBCUPFT		
88	J C fit	JCCUPFT		
89	I XCEL	IXCEL	R*4	number of saturated channels
90	t 1	T1	R*4	transparency correction (due to angle) for each main cup
91	t 2	T2		
92	t 3	T3		

-----Summary of analysis with aberration corrections made to velocities-----

93	n 1 cor	N1COR	R*4	moment densities corrected for transparencies	#/cc	PRAMAL
94	n 2 cor	N2COR				
95	n 3 cor	N3COR				
96	B R	BR	R*4	B field in RTN coordinates		
97	B T	BT				
98	B N	BN				
99	V R sum	VRMOM	R*4	moment proton velocities in RTN coordinates	km/sec	
100	V T sum	VTMOM				
101	V N sum	VNMOM				
102	10 V mom	VMACH	R*4	moment proton speed	km/sec	

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103	$NS_y^{mom}$	NSAMON	North-South angle of flow = $\text{ATAN2 } (VN, [VR^2 + VT^2]^{1/2})$	degrees
104	$EW_y^{mom}$	EWAMON	East-West angle of flow = $-\text{ATAN2 } (VT, VR)$	degrees
105	$V_R^{fit}$	VRPFT	R*4	proton velocity in RTN coordinates, fit
106	$V_T^{fit}$	VTPFT		
107	$V_N^{fit}$	VNPFT		
108	$ V ^{fit}$	WMAGPFT	R*4	proton speed, fit
109	$NS_z^{fit}$	NSAMPFT		flow angles, fit (defined as above)
110	$EW_z^{fit}$	EWAMPFT		
111	$V_R^{fit}$	VRAPT	R*4	alpha velocity in RTN coordinates, fit
112	$V_T^{fit}$	VTAFT		
113	$V_N^{fit}$	VNAFT		
114	$ V ^{fit}$	WMAFT	R*4	alpha speed, fit
115	$NS_y^{fit}$	NSAFAFT		alpha flow angles, fit
116	$EW_y^{fit}$	EWANAFT		
117	$n_{\alpha}^{mom}$	NAMON		alpha number density, moments
118	$W_{\alpha}^{mom}$	WAMON		alpha thermal speed, moments
119	$V_{x,\alpha}^{mom}$	VXAMON		alpha velocity, moments, s/c coord (no aberration correction)
120	$V_{y,\alpha}^{mom}$	YYAMON		
121	$V_{z,\alpha}^{mom}$	VZAMON		
122	IP <sub>A<sub>a</sub></sub>	IPACUPA	pk channel for alpha in each cup (estimated--not useful)	
123	IP <sub>B<sub>a</sub></sub>	IPBCUPA		

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124	$I_p C_a$	IPBCUPA	
125	NCHAN <sub>p</sub>	NESTCHP	estimate of # of channels from peak to 1/e of peak. derived from moment calculation
126	NCHAN <sub>a</sub>	NESTCHA	ditto for alphas
127	$ V_a - V_p _{max}$	VAMPOM	speed difference, not necessarily along B, moments
128	$\gamma (V_a - V_p, B)$	ANVAMPB	angle to B field
129	$en_a$	DNA	density criterion for alphas
130	$\cos(\hat{B}, \hat{n}_A)$	COSBACUP	cosines of angles between B and cup normals
131	$\cos(\hat{B}, \hat{n}_B)$	COSBBCUP	
132	$\cos(\hat{B}, \hat{n}_C)$	COSBCCUP	
133	$R_p^{max}$	MARPMOM	estimate of thermal speed from moments: $(w_A^2 + w_B^2 + w_C^2)^{1/2}$

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Molter - 11/2

11/6/86 - 1/24/86  
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RECORD LENGTH = 17908 BYTES



RECORD LENGTH = 17906 BYTES

98/521 - 98/521  
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